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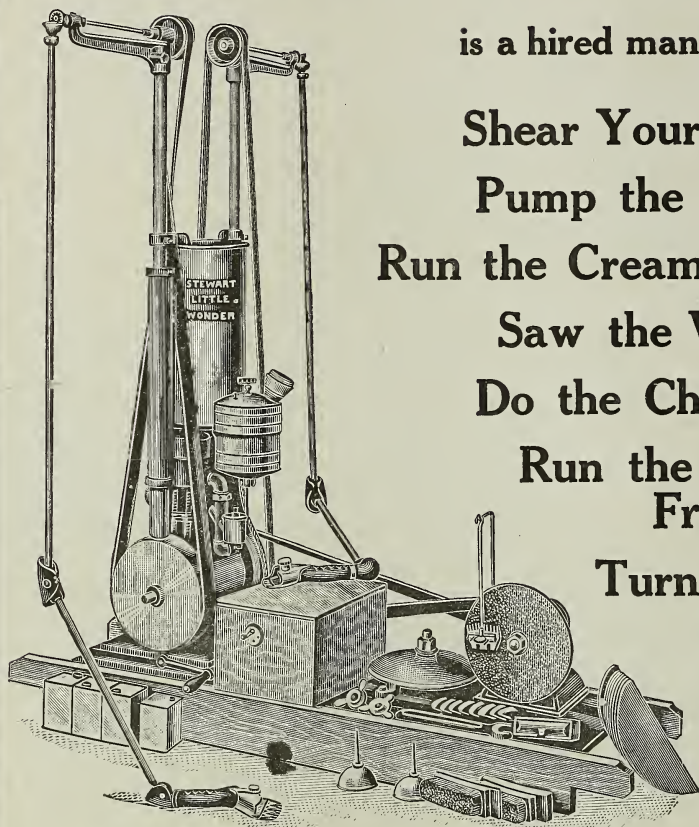
Horticultural Number



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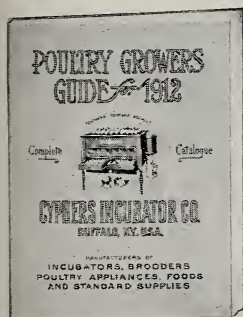
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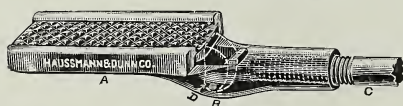
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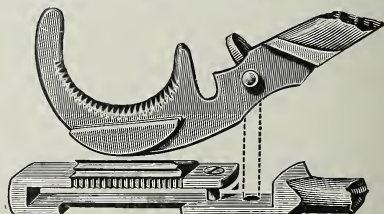
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HORTICULTURAL DISPLAY

THE AGRICULTURAL STUDENT

Vol. XVIII.

OHIO STATE UNIVERSITY, COLUMBUS, MARCH, 1912

Number 7

Foreword

WENDELL PADDOCK
Professor of Horticulture

THOSE of us who had the opportunity of attending the State Horticultural Society meeting and Fruit Show at Marietta were treated to a great surprise. It was not only because the show was extensive and made up of high-grade fruit, and because it far surpassed all former attempts; neither was it due alone to the excellent program. These features were all above the average, but the feature that was especially prominent was the wholesome "get-together" spirit that was everywhere displayed. Everyone appeared to be feeling good and doing his very best to make all feel at home.

If this spirit can be fostered and intensified, there is nothing in the way of horticulture that has been accomplished in other states that cannot be accomplished in our own Ohio. In fact, it is of just such spirit that leaders are developed. We already have visions of our markets being supplied with wormless and scabless fruit, of rigid grading and honest packing, and of fruit growers' marketing associations.

Large areas of land are being planted to orchards, and even more extended plantations are planned for the future. It is plain, then, that the old hit-and-miss plan of orcharding must be given up and all that is modern must be introduced if this fruit is to be handled profitably.

This situation naturally leads up to the question of what the Agricultural

College of the State University is doing in the way of educating the people. But this question need not be discussed further than to state that we are probably doing less than any other prominent state in the Union. That the demand for horticultural instruction is great is proven by the rapidly increasing number of students. We have facilities for about 30, but are actually giving instruction in some phase of horticulture to 314 students each week, besides the 77 Short Course students who elected our work.

The course is growing rapidly in spite of us, and in spite of instructional facilities the students are interested and are markedly successful in the work when they leave us. But what could not be accomplished with commodious class rooms, well equipped laboratories, modern greenhouses, a cold storage plant, and other facilities that are to be found in many of the colleges?

None but the best should be good enough for the future horticulturists of Ohio and we believe that this new horticultural spirit will demand that we have it. "Hope deferred maketh the heart sick, but when the desire cometh, it is a tree of life." The promise of better things for the horticultural department has been deferred a long time, but this new Horticultural Spirit makes optimists of us all and we believe that our great desire is about to be fulfilled.

III. Opportunities in Horticulture

W. J. GREEN
Ohio Experiment Station

THE commercial side of horticulture offers many openings to those who can count as their assets a love for the work and a determination to win. In fruit culture, vegetable gardening, and floriculture thousands have won competencies and but few have failed, as compared with most other occupations.

In seed growing and the nursery business, which are closely allied to the above, there may have been more failures, but there have also been larger fortunes made.

Both fruit and vegetable culture offer exceptional advantages to one with small capital. A young man may begin in either of these lines with but little else than a clear head and good muscles, plant, fertilize, till, make a living while he waits for nature to do her part, and in due time he finds himself the possessor of an assured income better than most of the learned professions yield. The possibilities are still greater in floriculture, nursery and seed growing, but with these more capital is required and risks are increased.

All lines of horticultural business have, in the past, been characterized by **intensive** operations, but the tendency now is toward the **extensive**. When combined with corporation, as it is in some cases, and coupled with business ability, this change, within reasonable bounds, must be for the better, as it gives wider opportunity to skill and good management. For a long time, at least, there must remain many openings in horticulture for men of small means but possessed of ability to think and labor.

It might be interesting to cite exam-

ples of men and women who have succeeded long before old age has overtaken them in building up a horticultural business which yields an annual income of from five to twenty thousand dollars. Cases are not rare where large communities are dependent upon the business built up and carried on by such men. There are other cases where almost entire neighborhoods have followed, with success, the lead of individuals of ability along some line of horticulture.

These communities have become noted for their special products; large returns have been received for these products; land has risen in value and prosperity has been shared by many.

While this phase of the subject is interesting, there is another which is equally so, but from a different standpoint.

Young men, and young women also, can find open to them many kinds of horticultural work, most of which promise financial returns, and in addition a great deal of satisfaction, especially if one has a bent, or is imbued with a love for a certain line of investigation.

It may seem out of place, in these days of the dollar, to speak of the satisfaction which the opportunity to seek after truth gives to those who are born investigators. Such people care little for the dollar, only as it helps them to carry on their chosen work. They are even willing to do, as thousands before them have done, to step aside for a time to earn sufficient to go on with an investigation. To one who would gladly give his life to horticultural investiga-

tion, the opportunity to do so and at the same time receive a competence is most welcome.

To a person of an investigating turn this privilege is more highly prized than riches. Our agricultural colleges and experiment stations are anxiously looking for men in horticulture who care more for truth than for fame or wealth.

What an opportunity would it have been to the men who have given us some of our best fruits, vegetables and flowers if they could have worked con-

may superintend an estate, fruit farm, park or cemetery. He may also act as horticultural adviser in case he has both knowledge and reputation. In some of these lines of work the pay is even better than in teaching.

Landscape architecture is a good field if one cares more to please his clients than for art.

If one who has some conception of art is made to face the necessity of putting in an Italian garden where it is a misfit, or is compelled for the sake of



LEARN TO KNOW WHY, FOR THIS TEACHES HOW AND WHEN.

tinuously at plant breeding, with no fear for themselves or families.

Those who love to teach horticulture have such opportunities now as they never had before. Professorships are open; books need to be written; the press seeks contributions, and compensation is at least fair in all these classes. If one has full knowledge and a ready pen, his contributions bring good compensation.

To the trained horticulturalist, with some literary ability, editorships are open, and if to the horticultural training one can add managerial ability he

money to do other things which offend good taste, he may find little interest in the work, but if he labors long enough and resolutely along right lines he will find both pleasure and profit. There are fine openings in this work for those with artistic temperament and training and who have as well a love for nature and a considerable knowledge of trees and plants.

It may be said in summing up that the opportunities in horticulture, open to college graduates, are more numerous than to the man with a practical training only. Even along practical lines

this is true, and in professional horticultural work college graduates have a field almost to themselves.

College graduates should, however, get over the puerile notion which some of them entertain that they ought to have the best places and highest salaries **because** they are college graduates.

It has been easy in recent years for untrained men to get into professional horticultural work. Most of these, no doubt, have been able to work up to a state of efficiency, but not a few have not only had to learn practical details but some are wholly unable to prepare bulletins and other matters for the press. It is not with a spirit of criticism that these shortcomings are mentioned, but to emphasize the fact that a

broader training is needed for the professional horticulturist.

By this broader training is not meant the securing of a master's or doctor's degree, but one should be able to see things from the same viewpoint as does the man of affairs.

One needs also something more than a working knowledge of the sciences relating to horticulture. He needs the **scientific spirit**; the desire to learn the truth, as opposed to the impulse to bolster up a theory.

To men of this class horticultural opportunities are open on every side. There were never so many horticultural opportunities as now, but the future will have far more prizes than the present for willing and capable workers.



A BUDDING HORTICULTURIST.

The Home Acre

B. W. ANSPON, '10

Asst. Prof. of Horticulture, Mississippi Agr. Mech. College

AS a general rule one finds that less care and time are expended in developing the home ground than any other part of the farm. Yet, withal, this spot should be the most beautiful and best kept on the farm. Too frequently one finds the farm home and grounds badly neglected, whereas the

all who pass by. The beauty and refining influence of a well-kept home grounds will do much to make home the dearest spot on earth.

When one notices the many beauties of Nature on all sides, why should the subject be ignored on the farm? The farm, with all its natural charms, can be



A BEAUTIFUL EFFECT WITH SPIREA.

fields and pastures are kept in good condition.

As the home acre surrounds the home, no pains should be spared to make it as attractive as possible. By surrounding the home with beautiful plants, as trees, shrubs, and flowers one can create a most pleasing picture that will be the pride of the owner and the delight of

made a most pleasing living place at very little expense. The enhanced appearance of the home grounds and the added beauty of the farm does much to lessen the drudgery of farm life. Nothing expensive need be undertaken. Old fences should be either rebuilt or torn down. Where trees are broken or diseased, prune the defective portion or

grub out the tree entirely when too far gone to save. To harmonize best with the surroundings the fence should be painted a dull green, as that color is least conspicuous.

Unsightly objects on the home grounds should be removed or so screened by judicious planting as to render them invisible to the passer-by. The



A DELIGHT TO THE EYE.

fence corners should be cleaned out; all rubbish, as tin cans, worn-out farm machinery, etc., should be hauled away from the home acre.

To make a pleasing picture of the home grounds it is necessary to have some background upon which to make the picture. This background is the lawn, which should always find an important place in the home grounds. Nothing adds more charm to the home than a vast expanse of unbroken green. Too frequently one finds the lawn spoiled by improper planting of trees, shrubs and flowers. Keep the center open and plant the flowers or shrubs in masses and not as isolated plants scattered here and there throughout the yard.

In planting the home grounds prepare a rough plan so that some idea can be pursued. Carry out this one idea in arranging the grounds. Unity and coherence are essential in securing a good ef-

fect. When laying out the beds for shrubbery or flowers avoid straight lines. Arrange them in graceful curves, adapting them wherever possible to the slope of the land.

Among the large number of shrubs indigenous to Ohio one can find a large number that will lend themselves admirably to planting in the home grounds. One can find such shrubs as dogwood, hazel, alder, sumach, redbud, wild rose, etc., wild in most parts of the state. These can be dug up and set out at a very small expense. Each locality has a flora well suited to planting in the home grounds. By careful selection one can secure shrubs that bloom at various times.

Where one is willing to go to a little expense one can purchase such shrubs as will give a succession of blooms throughout the growing season. These should be so planted that from one point one can see the various groups of shrubs as they come in bloom. These



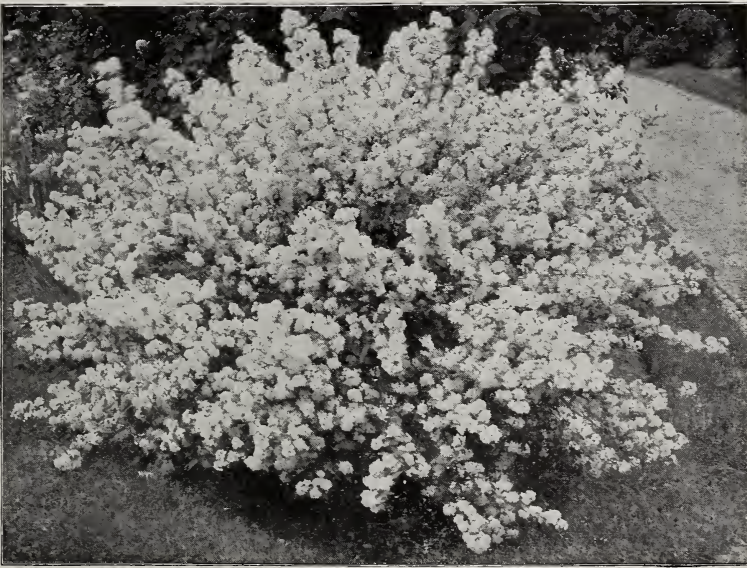
HOLLYHOCKS.

shrubs give a pretty picture, not only during the growing season but also in fall and winter. During the dormant season one has their pretty and various highly colored fruits, as the red fruits of the corral berry, the waxy white of the snowberry, the oblong red fruits of

the barberry. The various colored bark and general mode of growth of each shrub proves an attractive object.

In arranging the shrubs in the groups, those with a heavy, upright habit of growth should be placed to the rear central portion, so that they may serve as background against which the lower-growing sorts may be arranged in regular gradation to the border line. Close on to the border line one should plant recumbent sorts, so that the beholder may see the group

looked on the home premises is the proper location of shade trees. As a general rule these should stand as single specimens or in irregular groups, though in some cases they may be planted in long rows, as when used on both sides of a long road or drive. Among the deciduous trees we have a large number of excellent trees from which to select. These trees have a great variety of colors, leaf forms, and general modes of growth. Those gorgeous colors so characteristic of your northern autumn



Deutzia Crenata, "Pride of Rochester."

from the lawn to the top of shrubbery without receiving the least offense from bare places between the turf and the foliage of the mass itself.

The use of low-growing, dense shrubs is an essential to securing a good group or border as are the tall-growing sorts. A well arranged group and border of shrubs planted around the home serves to "tie" the building to the ground. Thus we have an unbroken line, carrying one from the lawn to the house itself by a graceful curve of shrubs.

An item that should not be over-

appear only on trees which shed their foliage in the fall, at the approach of cold weather. Such trees as the oaks, maples, elms, lindens, cucumber trees, tulip, poplar, birch, catalpa, etc., make ideal trees for planting on the home grounds, each tree having characteristics, as foliage, etc., peculiar to the variety.

Quite a few places on the grounds cannot be filled either by the use of trees or shrubs. In such cases where we wish to screen or hide unsightly objects as outbuildings, fences and the like we de-

pend upon hardy and annual climbers. Such vines as the trumpet flower, Boston ivy, Judzu vine, Virginia creeper, various forms of honeysuckle, are the most common of the hardy vines. Among the annual vines we have such blooming vines as moonflower, morning glories, cypress vine, *coboea scandens*, and many others.

For a beautiful effect around the porch and front of the house we have



A BEAUTY SPOT.

the climbing roses, of which we may select a variety of colors. The wistaria is a beautiful climber to cover a trellis or to screen the side of a porch.

Among the climbing roses to be recommended are the following: Crimson Rambler (red), Dorothy Perkins (pink), White Pet (white), Marechal Niel (yellow), Philadelphia Rambler (crimson), Veilchenblau (blue rambler).

All walks and drives should be made as simple and direct as possible, giving them easy, graceful curves, thereby avoiding all abrupt and sharp angles. The main purpose of a drive being that of ingress and egress, it should therefore be constructed to meet that demand only. Where no tree or shrubbery serves as a reason for a curve in the drive, plant in a group of shrubs or a tree to serve that purpose.

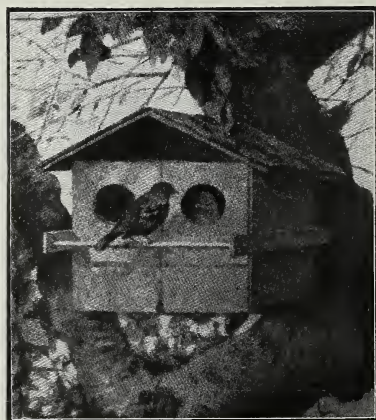
In making walks on the home grounds it is a good plan to follow the

line of travel as shown on the worn places on the lawn. A worn path on the grounds is the logical place for a walk. Have the walks lead to some definite object and not meander around aimlessly without any occasion for their use.

The Home Garden.

Each country home should have a good garden. Nothing adds more to the country home than a variety of choice vegetables and fruits, grown in the home garden. By having the garden sufficiently large one can grow an abundance of vegetables and fruits to supply the table and have a large surplus to preserve for the winter.

The logical place for the garden is in close proximity to the house, not several hundred yards away as so often is the case. Nearness to the house will be of great value to the busy housekeeper. Then she can go out and gather the vegetables fresh before each meal, whereas if located further from the



NEIGHBORS.

house, the vegetables would probably be lacking entirely at that meal.

Much of the tedious labor as weeding, hoeing, and other hand labor can be dispensed with by planting in long rows, sufficiently far apart as to permit of horse cultivation. By proper selec-

tion and planting at intervals, one can have a succession of vegetables throughout the growing season and enough potatoes, turnips, celery, etc., to store in the cellar for the winter and spring months.

To grow good vegetables one must have a fertile soil to which manure should be added each fall in order to keep up the fertility. Such a soil will warm up much more quickly in spring and give better results than a soil not so treated. Where possible, some means for watering should be provided, so as keep the plants growing at their best, even during dry spells. This can often be done by piping the waste water from the watering troughs at the barns. When the garden is so graded as to give a gradual slope, it is a simple matter to water the plants by surface irrigation. All that is necessary is to open the valve and allow the water to run between the rows.

A sheltered portion of the garden should be given to strawberries and the other small fruits, as raspberries, currants, blackberries and gooseberries. Blackberries can be planted along the fence, thus serving as a screen to that section of the garden.

The garden should be surrounded by a good fence of such material as to ex-

clude chickens. To make the posts less conspicuous, paint them a dark green. The same can be done with any adjoining buildings.

Around the border of the garden one can plant the hardy and annual flowering plants so varied in form and color. By having such a border we not only have the beautiful color effect in the garden but also an abundance of blossoms that serve well for cut flowers with which to adorn the table. Although such flowers can be grown mixed in the shrubbery beds, they will produce better flowers and give more satisfactory results when planted in the garden, where they secure more attention and more plant food.

* * * * *

The above give merely a slight idea of the possibilities that confront one in beautifying the home grounds. Now that the country has made such great advances in the last few years as to farms, buildings, etc., more time and attention should be given to caring for and embellishing the home grounds. Few homes are so well adorned that there is not room for improvement. The increased pleasure of living on a well planted and kept farm is in itself reason enough for exerting all efforts to make "home the dearest place in all the world."



Johnny Appleseed

W. G. KESLER, '15

AMONG the pioneer heroes of Ohio there is one man whose name, seldom mentioned now, deserves to be recorded in blazing letters in the early history of this state.

The first reliable trace of our modest hero finds him in the Territory of Ohio, in 1801, with a horse-load of apple seeds, which he planted in various places on and about the borders of Licking Creek. During the next five years there is no account of his movements, but on a pleasant spring day in 1806, a settler in Jefferson County noticed a strange craft, with a peculiar occupant dropping down with the current of the broad Ohio. It was "Johnny Appleseed," by which name Jonathan Chapman was afterward known in every log cabin from the Ohio river to the Northern lakes, and westward to what is now the State of Indiana. With two canoes lashed together he was transporting a load of apple seeds to the western frontier, for the purpose of creating orchards among the white settlers there. With his canoes he passed down the Ohio river to Marietta, where he entered the Muskingum. Ascending that river, he planted his seeds here and there, until his supply became exhausted.

These are the first well-authenticated facts in the history of Jonathan Chapman, whose birth, there is good reason for believing, occurred in Boston, Massachusetts, in 1775. At the time of his appearance on Licking Creek he was twenty-six years of age. From this time on "Johnny" devoted his time to the planting of apple seeds in remote places. The seeds he gathered from the cider-presses of Western Pennsylvania. His canoe voyage in

1806 appears to have been the only occasion upon which he adopted that method of transporting them, as all his subsequent journeys were made on foot. Securely packed in leathern bags, the seeds were conveyed, sometimes on the back of a horse, and not infrequently on his own shoulders, either over a part of the old Indian trail that led from Fort Duquesne to Detroit or by the "second route through the wilderness of Ohio."

In personal appearance Chapman was a small and very active man; he had long dark hair, a scanty beard that was never shaved, keen black eyes. His dress was of the very oddest. Generally, even in the coldest weather, he went barefooted, but sometimes for his long journeys, he would make himself a rude pair of sandals. It appears to have been a matter of conscience with him never to purchase shoes, although he was rarely without money enough to do so. On one occasion, in an unusually cold November, while he was traveling barefooted through mud and snow, a settler who happened to possess a pair of shoes that were too small for his own use forced their acceptance upon Johnny. A few days afterward the donor met Johnny contentedly plodding along with his feet bare and half frozen. With some degree of anger he inquired the cause of such foolish conduct. For his pains he received for reply that Johnny had overtaken a poor barefooted family moving westward, and as they appeared to be in much greater need of clothing than he was, he had given them the shoes. His dress was generally composed of cast-off clothing that he had taken in payment for apple trees. In his later

years, however, he seems to have thought that even this kind of second-hand raiment was too luxurious, as his principal garment was made of a coffee sack, in which he cut holes for his head and arms to pass through.

In the matter of headgear his taste was equally unique. His first experiment was with a tin vessel that served to cook his mush, but this was open to the objection that it did not protect his eyes from the beams of the boiling sun;

boys of the settlements forbore jeering at him. The Indians also treated Johnny with the greatest kindness. By them he was regarded as a "great medicine man" on account of his strange appearance, eccentric actions, and, especially, the fortitude with which he could endure pain, in proof of which he would often thrust pins and needles into his flesh. His nervous sensibilities really seem to have been less acute than those of ordinary people. Thus his method of



DISCIPLES OF JOHNNY APPLESEED.

so he constructed a hat of pasteboard with an immense peak in front.

Thus strangely clad, he was perpetually wandering through forests and morasses and suddenly appearing in the white settlements and Indian villages. But there must have been some rare force of gentle goodness dwelling in his looks and breathing in his words, for it is the testimony of all who knew him that, notwithstanding his ridiculous attire, he was always treated with the greatest respect by the rudest frontiersman. What is a better test, the

treating the cuts and sores that were the consequences of his barefooted wanderings through briars and thorns of the forest was to sear the wound with a red-hot iron and then cure the burn.

His diet was as meagre as his clothing. He believed it to be a sin to kill any creature for food and thought all that was necessary for human sustenance was produced by the soil.

The religious ideals of Johnny Appleseed were very peculiar. He was a most earnest disciple of the faith as taught by Emanuel Swedenborg. He enter-

tained a profound reverence for the revocations of the Swedish seer and always carried a few old volumes with him. These he was very anxious that everyone should read, so he divided his books into several pieces, leaving a portion at a log cabin, and on a subsequent visit furnishing another fragment and continuing this process as diligently as though the work had been published in serial numbers.

Next to his advocacy of his peculiar religious ideas, his enthusiasm for the cultivation of apple trees in what he termed "the only proper way," that is, from the seed, was the absorbing object of his life. He denounced as absolute wickedness all devices of pruning and grafting.

Johnny was active in the work of protecting animals from abuse and suffering. Whenever he saw an animal abused, he would purchase it and give it to some more humane settler on condition that it should be kindly treated and properly cared for. The only occasion on which he destroyed a venomous reptile was a source of long regret, to which he could never refer without manifesting sadness. He had selected a suitable place for planting apple seeds on a small prairie, and in order to prepare the ground he was mowing the long grass, when he was bitten by a rattlesnake. In describing the event he sighed heavily and said: "Poor fellow, he only just touched me, when I, in the heat of my ungodly passion, put the heel of a scythe in him and went away. Some time afterward I went back, and there lay the poor fellow dead." On one occasion, a cool autumnal night, when Johnny, who always camped out in preference to sleeping in a house, had built a fire near where he intended to pass the night, he

noticed that the blaze attracted large numbers of mosquitoes, many of which flew too near to his fire and were burned. Accordingly he immediately brought water and quenched the fire, accounting for his conduct afterward by saying, "God forbid that I should build a fire for my comfort which should be the means of destroying any of His creatures!" At another time he removed the fire he had built near a hollow log and slept on the snow because he found that the log contained a bear and her cubs.

In 1838, thirty-seven years after his appearance on Licking creek, Johnny noticed that civilization, wealth, and population were pressing into the wilderness of Ohio, so he turned his steps steadily towards the setting sun. During the succeeding nine years he worked on the western border of Ohio and in Indiana. In the summer of 1847, after his labors had literally borne fruit over a hundred thousand square miles of territory, at the close of a warm day and after traveling twenty miles, he entered the house of a settler in Allen County, Indiana, and was, as usual, warmly welcomed. He declined to eat with the family, but accepted some bread and milk, of which he partook while sitting on the doorstep. He slept, as usual, on the floor, and in the early morning he was found dead.

Thus, at seventy-two years of age, forty-six of which had been devoted to his self-imposed mission, died one of the memorable men of pioneer times, a man who never inflicted pain or knew an enemy, a man of strange habits, a laboring, self-denying benefactor of his race. Homeless, solitary, and ragged he trod the thorny path with bare and bleeding feet, intent only upon making the wilderness more fruitful.

The Ohio State Horticultural Society and the New Building

A. D. SELBY

Chairman of Committee, Ohio Experiment Station

AT the last annual meeting of the State Horticultural Society, held in Marietta, Ohio, January 23 to 26, 1912, a committee was on motion appointed:

"To endeavor to secure at the Ohio State University, at as early a date as possible, adequate buildings, equipment and support not only for the Department of Horticulture and associate departments, but looking to the establishment of a Department of Plant Pathology in connection with that work."

The President of the State Horticultural Society is ex-officio member of the committee. The committee appointed is as follows: A. D. Selby, Botanist Ohio Agricultural Experiment Station, Wooster, O., Chairman; Ernest J. Riggs, Columbus, Ohio; L. B. Yaple, Chillicothe, Ohio; W. W. Farnsworth, Waterville, Ohio; Philip C. Van Rensselaer, Port Clinton, Ohio; John F. Cunningham, Cleveland, Ohio; N. E. Shaw, State Inspector, Columbus, Ohio; L. D. Eaton, President, Proctorville, Ohio (ex-officio).

It is the intention of the committee to seek a meeting, or meetings, jointly with the President and Board of Trustees of the University, in order to secure, if possible, their indorsement of the proposition to make such building for Horticulture, Forestry and Plant Pathology a first request in the matter of building appropriations in the next legislature, and then to use every reasonable endeavor to that end. Such a meeting is yet to be arranged and the feelings and intentions of the officers of

the University are yet to be made known.

What Are the Wants of the Departments of Horticulture and Forestry?

The needs of the department of Horticulture and Forestry in the matter of requirements for class and laboratory purposes, and greenhouses for propagation purposes have been apparent for several years. It was recently stated to the writer that the claims of the departments of Horticulture and Forestry for a new building really contested the claims of the departments of Botany and Zoology for first place on the list in presenting the matter of new building to the last legislature. It must be apparent to everyone that with preparation made and construction about to begin on the building for Botany and Zoology the claims of the departments of Horticulture and Forestry are entitled to first rank. No comparisons are necessary between the relative importance of this or that line of instruction offered in the University; each one has its real claims to be made a part of the institution. We grant that all lines are entitled to proper accommodations and support.

Applied Science the Feature of Our Times.

While granting that all science is good and that the established lines of instruction were instituted to meet real needs, we must not forget that applied science is the characteristic feature of our times, both in education and in industry. The College of Agriculture has been established to furnish in this College the instruction in the branches of

applied science which pertain to plant and animal production. The very rapid increase in attendance in the College of Agriculture has already passed the point where it makes the need for more accommodations a crying one. It is not sound policy to defer even as long as will now be necessary, the construction of a new building for the departments of Horticulture and Forestry. This new building must be large enough to accommodate a reasonable number of lines which deal with applied botany. The demand for this work must yearly increase and anything short of an adequate building and large, substantial greenhouses will be short-sighted, to say the least.

The Need For a Department of Plant Pathology.

Allusion has already been made to Horticulture and Forestry as lines of applied botany; there is still another line of applied botany that must of necessity secure increased recognition in the next half-century. Increase in plant diseases is the law of our aging culture; increase in plant diseases is likewise the law of our intensifying culture. Along with this combination of aging and intensifying culture in our state will come an increasing number of problems. These problems must be met as they arise. It is neither wise nor economic to allow accumulating losses to result from lack of adequate investigators and workers in this line. As Chief of the Department of Botany of the Ohio Agricultural Experiment Station from 1894 to 1912, having under

his direction the investigation of plant diseases, the writer is in a fair position to judge of the present requirements in plant disease instruction. When called upon to fill three vacancies in the position of assistants to investigate various lines of plant diseases two years ago he was unable to secure a single Ohio-prepared man. The institutions, as they now exist, are not preparing men fast enough to meet the increasing needs of plant disease investigation—how much more will this be true before the proposed new building can be constructed and equipped? The larger state universities in the Union that have recently taken up this problem have decided that such a department properly belongs among those of the College of Agriculture. The examples at hand are the Department of Plant Pathology at Cornell University, the Department of Agricultural Botany in the University of Nebraska, and the Department of Plant Pathology at the University of Wisconsin.

It cannot long remain concealed from the farmers and fruit growers of Ohio that instruction to meet their special wants will be required in the College of Agriculture. The only way to meet these adequately is by establishing a Department of Plant Diseases within the College of Agriculture and offering in these departments the courses which shall meet the needs of agronomists, horticulturalists and foresters. We do not think that Ohio intends to remain in the rear in the matter of progress.

Horticulture in Extension Work

J. H. GOURLEY

Professor of Horticulture, Extension Department

IF the conditions under which we are working and living to-day were the same as those under which our forefathers labored it would not be necessary for Horticulturists here and there over the country to say that the farm orchard is doomed, and that the business of fruit growing must pass into the hands of specialists. They had their problems, we have ours, and our sons will have theirs. Some are the same, while others are new ones, and each generation has more difficult ones than the last, probably in line with what seems to be the necessary struggle for existence. As we learn the control of the serious orchard pests and simplify the methods of prosecuting the work, we are simply lessening the problems of those who come after us with their more serious problems of marketing which competition is bound to bring.

After these facts are established the next step is to carry the information in a practical, working form to the laymen who are engaged in the production of the fruit crop. It is the mission of all the educational agencies at work along this line. The Agricultural Extension Department of Ohio State University has been coming in contact with thousands of our Ohio farmers who are engaged in, or interested in taking up some phase of fruit growing. While it is the aim of those engaged in the work to reach the people "with both information and inspiration," the former is the chief end. For no man knows from intuition how these insect and disease pests work, nor how they may be controlled, and it must necessarily follow that each individual must learn the truth as the best investigators have dis-

covered it. This method of college extension work is probably the most direct medium yet attempted to carry the truth to the user of the truth. Dis-course and demonstration constitute the method, of driving home that truth.

Many of the farm orchards which had fallen into neglect are receiving care, having returned nice profits the first year attention was given them. A net return of two to four hundred dollars per acre is not infrequent from old neglected orchards and as no previous labor was spent upon them it is, as has been suggested, "like reaping where we have not sown." Probably no form of agricultural work has given such immediate results as the care of old orchards. It is because they are just begging to have a chance to do something as evidenced by the profusion of bloom we see nearly every spring.

Well balanced orchard operations are what we are striving to attain, for no one practice, whether it be spraying, pruning or some other good practice is a panacea for all the evils with which we have to contend. Sooner or later we will be forced to see that we must raise a high per cent of uniform, perfect fruit, or else our particular orchard is doomed. Whether we wish it or not, we are in competition with the best growers, and must measure our standard by the best or we will find ourselves in the class who say that there is nothing in the orchard business and that overproduction is inevitable.

One of the great lessons we must learn is that after we have produced a good grade of fruit, we must keep it until later in the season before dispos-

(Continued on page 400.)

A Horticultural Appreciation

F. M. LUTTS
Huron County, Ohio

THE writer has been a consumer of farm fruits for many decades, the first being that "scraped" from an apple with a wooden-handled case knife by a fond mother who knew the value of the succulent pulp as a promoter of health. For the past 30 years our family has eaten the fruits borne by trees and plants of our own setting—of apples, pears, peaches, plums, cherries, persimmons, grapes, blackberries, raspberries, currants and strawberries, and this experience with farm fruits is rather above that of the average farmer. But with all this experience and years of familiarity with farm fruits and vegetables it was left for the instruction as given to the Winter Course class in Horticulture to show us that what we really knew about the subject, as compared to what there was to know, looked like "the little end of nothing whit-tled down to a point."

The value of the course in Horticulture to Winter Course students varies, of course, with the ability of the individual student to receive of the instruction given. However, no person, old or young (there were both in the 1912 class), who is interested at all in the subject can attend the 32 lectures of about one hour each and the eight laboratory periods without learning something. One of the important things that will be learned is that the instructions offered are arranged progressively so that the student can obtain the greatest amount of information in the least pos-

sible time, and this of the things most important and necessary for successful farm horticulture.

Another thing that will leave a lasting impression is the persistent efforts of the various instructors to instil into the minds of their pupils the importance of the farm orchard and the farm fruit garden, both from the standpoint of home value as a health producer and of the market value as a wealth producer. The necessity for eternal vigilance in the matter of recognizing and control of injurious fungous diseases and insect enemies were taught and the various methods of treatment were explained in such a manner that they were bound to "stick."

During the eight weeks the writer came in close touch with many of the 77 students of the winter course class of 1912 and the sentiment expressed was that of commendation for the course of instruction offered and the courteous treatment received at the hands of the instructors, all of whom seemed to think the untaught thoughts of their pupils. They catered to these thoughts, rather than to hurl at us the scientific ideas of the professional horticulturist.

Just to drop a word of advice to any prospective student, the writer will say that no matter what other courses are considered, no person can afford not to include horticulture, a course which teaches one important factor in making farm life worth living—better fruit and vegetables, and more of them.

"This is an art
Which does mend nature,
Change it rather, but
The art itself is nature."

How to Grow Good Tomatoes

ADOLPH KRUHM, '12

THE four essential factors worthy of closest study in connection with growing tomatoes for either profit or pleasure are:

Goods seeds and plants,
Well prepared soil,
Thorough methods of cultivation,
Suitable sorts.

The failure to pay close attention to any or all of these points is responsible for the many indifferent results some planters obtain with this otherwise easily grown and very responsive vegetable.

Take the question of seeds, for instance: a packet of seeds will produce from 300 to 400 plants—enough to plant a good-sized tomato patch. Is ten cents too much to pay for this start when it costs many dollars for land and labor throughout the summer to get results? Yet many planters are satisfied with inferior strains and sorts that can be bought at 5c per packet because they imagine a

“saving” of 5 cents has been effected at the start. My advise is: Buy your seeds from specialists—men who make special efforts along certain lines and you are sure of getting the best.

Start your seeds in a hotbed or in boxes in the house by the end of March

or April 1st. The soil should consist of good loam, leaf mould and sand, mixed in equal proportions. Make rows 4 inches apart, $\frac{1}{2}$ inch deep, into which sow seeds thinly. Cover and press soil down firmly with a board or hand, and water well. Keep box in a warm sunny window and, after seedlings appear, stir soil frequently between the rows. When seedlings are 3 or 4 inches tall transplant into another hotbed or boxes, setting them 4 inches apart each way. Harden them gradually, encourage big roots and small top growth. It isn't the size, but the age of a tomato plant that counts. If time permits



Branch of Improved Dwarf Champion Tomato.



and plants make a thrifty growth, another transplanting, this time into individual pots, will prove highly beneficial.

When frosty nights become a matter of the past (depending upon seasons), set out these plants in rows 3 feet apart each way. The piece of ground should have been put in tiptop condition by liberal manuring, deep plowing or spading, and thorough harrowing or raking. Don't take this matter of preparing the ground lightly. Tomatoes need lots of moisture and only well prepared soil will hold moisture sufficiently long in dry seasons to mature good crops. Shallow plowing, lack of humus from decayed manure, and poor surface preparation of the soil are among the common reasons for poor tomato crops. The more care exercised to get the patch in good shape before planting, the easier will be cultivation afterwards.

Thorough cultivation consists of going through the rows both ways at least once a week as long as the plants permit with a fine tooth cultivator, wheelhoe or handhoe. Always maintain a

fine layer of dust-like soil on top of the ground. It will prevent the evaporation of moisture, which should be conserved. During the latter stages of development, do not cultivate too deeply close to the plants. Many fine feeding roots penetrate the soil right next to the plant clear up to the surface and a disturbance of these roots may seriously check the development of plant and fruit.

In many localities, staking and pruning the plants is now practiced freely. This method, while entailing much extra labor, is the surest means of getting the largest amount of marketable fruits from patches of limited size. This is the extreme of "intensive" cultivation. Each plant is trained to a pole, four or five feet tall. All superfluous branches are cut out and the upward growth of plant is checked after the fourth set of clusters has been produced. Or, strong posts are driven twenty feet apart along the row and these posts are connected with strong wires to which branches are tied with soft twine. This method of cultivation permits the setting of plants two feet apart

in the row, instead of three. Small patches handled in this manner will often outyield acres on which the common way of letting vines spread is practiced.

Suitable sorts, constitute the last, but not by any means the least important point, in this chapter. Do you realize that there are hundreds of varieties sold by as many different seedmen? That one or the other sort may be just the thing for your soil and climate, while the sort listed right next to it may prove a dismal failure under precisely the same conditions? There are tomatoes for all purposes, some especially adapted for certain sections of this country and some in special demands in certain markets.

A few extra early sorts are not profitable for home-garden culture, because their season of bearing is too short. Other sorts will not thrive in certain sections of this country because they are subject to blight. Still other sorts will not sell in certain markets because they are not of the right color. Consider all these points well and then decide what you need, what you want the fruits for and how you are going to produce them. A clear analysis of these points may not help you to a brilliant

success, but it will prevent you from making the most common mistakes in tomato culture.

Tomatoes may be divided into four classes according to season, color and habit of growth:

Early and Late Sorts,
Purple and Scarlet Sorts,
Tall and Dwarf Sorts,
Small and Odd-shaped varieties.

The last named are not of sufficient importance to deserve analysis. But the other three classes contains the sorts you need and, to help you, I give here with those few that are known as "standards" throughout the country:

Purple Sort: June Pink, extra early; Beauty, early and main crop; Livingston's Globe, early main crop for south; Buckeye State, large late.

Scarlet Sorts: Sparks Earliana, extra early; Livingston's Hummer, early round; Livingston's Stone, main crop and late; Chalks Jewel, Perfection and Favorite, midseason. All of above are tall or vining varieties.

Of the **Dwarf Sorts**, Improved Dwarf Champion is the most satisfactory early, while Livingston's Dwarf Stone is the dwarf main crop variety for all sections of the country.



The Easter Lily

L. E. MELCHERS, '12

SURELY everybody knows that world-wide famous flower, the Easter Lily, even though he be not well posted in floriculture; but has it ever occurred to him what attention, nursing and codling it requires to bring this flower to its perfection? Let me say that there is no other flower in this Y-ffiCoqK -b jou vma C4trei filh'nl class that causes a "grower" more sleepless nights, worry and anxiety than this particular one. Stop and think it requires nearly three-quarters of a year from the time you plant the bulb until you have the plant ready for market, remember also that you do not want them in full bloom a week or two before the holidays nor a couple of days after, but just in time to get them on the market in their prime.

There are a number of species which are used for forcing in the greenhouse, but the main ones are *Lilium Harrisii*, *Lilium Longiflorum* and *Lilium Gigantum*, and of late they are growing a certain species in California. The greater share of the bulbs come from the Bermuda Islands.

The bulbs are received from the wholesale houses here in the United States as early as possible and this is usually about the beginning of September. They are somewhat tender and therefore are carefully packed in boxes containing buckwheat hulls or some other similar material. In order to prevent excessive evaporation, each bulb is dipped in a mud bath which also protects the lobes from being injured.

They are then planted in 5 or 6 inch pots, almost any kind of soil being used. The great secret of getting a good start is to have the soil well packed around the bulb. The pots are then

placed in a dark place and should be well watered. A very convenient place is under the benches of the greenhouse, making it dark by means of cheese cloth or muslin tacked to the edge of the benches. Here you can easily water the pots and see how they are progressing. The main thing that must be sought after in this "stage of the game," is a good root growth and this is accomplished by darkness, coolness and moisture. It may be stated here that the cause of so much failure in the growing of bulbous plants by the amateur is due to the fact that not sufficient root growth was obtained before the bulbs were brought to the light. The best results are always obtained by having first kept the bulbs in a dark, cool place for six weeks or even longer.

After the lily bulbs have been under the above conditions for a few weeks, it is always of interest to the grower to find out just what is taking place beneath the soil in the pots. His curiosity is satisfied by taking a pot, placing his hand over the top, inverting, and giving the pot a few slight taps against the side of the bench or on the edge. The entire contents are removed in a lump and if you are able to see a mass of white, healthy-looking root hairs threading their way in between the soil particles, you may rest assured that all is coming along nicely.

Within five or six weeks, depending upon the variety and the conditions, the little spiny, yellow-colored stalk starts to make its appearance. It lacks chlorophyll and will show little green coloring matter until it is brought to the light. Of course, all bulbs are not the same size and hence have different amounts of food material stored in them, and as

a result some will show more vitality than others, so we would expect that these little shoots will not make a simultaneous appearance. The pots are removed to the benches as is seen fit by the florist. No special temperature is needed at this stage, anywhere from 50 to 60 degrees during the night and a little warmer in the day time. After they once get sunlight, the rudimentary stalk and leaves soon color up. Growth should be slow but steady and as the leaves develop the pots must be separated so as to give more light and air to the plants.

When they have attained the height of six or eight inches you can usually feel the small buds (the undeveloped flowers) in the tips of the plants, but these are surrounded by leaves and are invisible. Great skill is required to bring the plants from this state to that of flowering and to get them there just at the right time. From the time of the appearance of the buds, the plants may still have twelve weeks to grow before the buds will open. If during this time a cloudy spell of weather sets in, it becomes necessary to raise the temperature during the day time by artificial means, i. e., turning on more steam or hot air. Should the opposite take place and a streak of sunny, warm weather occur then it becomes necessary to shift the plants to a cooler section of the house and the artificial heat cut down and ventilation given. When Easter comes early in the year, as it did two years ago, it makes it still more difficult to bring your crop to maturity at the right time. It must be remembered that this is not a crop like the ordinary hot house vegetable or the carnation which can be sold, as a rule, at any time of the season, but more like the chrysanthemum, which has its main demand on a certain day of the year.

As Easter does not come on the same date every year and as weather conditions vary, it can easily be seen that data on the conditions of the crop, from year to year on a particular date is not an easy thing to keep nor a matter to be relied upon; so many of the older growers resort to their judgment. The oldest and most experienced men in the business always feel a little timid and breathe a sigh of relief when they know that they have their lilies, a "sure thing." If one has 2,000 pots planted and an average stalk gives four buds, and these wholesale at 15c a bud, or retail at 25c, the loss or gain is no small item to the ordinary florist. After Easter Sunday the demand for these flowers rapidly decreases, and most of them must be sold at a sacrifice.

The Easter lily is quite a disease resistant plant and neither is it subject to insect attacks. The only disease which is very troublesome at times, is the so-called lily disease. The grower has no way of controlling it and there is absolutely nothing to be done with a plant that is troubled with this disease. It is right in the bulb and does not make its appearance until the plants are 4 or 5 inches high. The first indications are the presence of little oval spots, yellow in color, which are to be found all over in the tissues of the foliage. As they increase the plants stop developing and are stunted for life; such infected plants are of no use and the sooner that they are destroyed the better, for blooms will never set. The *Lilium Harisii* seems especially subject to this disease and this species of lily is not used as much as it was once upon a time simply due to this.

The only insect that is at times troublesome is the common green aphid or plant louse which is to be found in every greenhouse. They do their dam-

age by getting around in the heads of the plants at the time that they are beginning to bloom. If they are not combated at the start they may get so numerous that the flowers are rendered unsalable. The usual method of treatment, which is usually effective, is the smoking method, using either tobacco stems or tobacco paper. In all cases care must be taken not to smoke too heavily or injury may be done to the plants. This, together with syringing with a strong, cold stream of water will kill the insects. Sprinkling tobacco dust on the plants is a good thing, later syringing it off with water.

When the plants are 12 or 18 inches high they may require staking up, for the heavy flowers are located on the extreme top of the stalk, which is not always of sufficient strength to carry its load. There are very few people who really see the true perfect and complete flower of the Easter lily. Have you ever looked into one of the delicate bells? If so, did you notice that there was

something lacking which makes the flower a perfect as well as a complete one? As soon as the buds open sufficiently, the anthers are removed from the filaments of the stamens. This prevents the pollen from being scattered around on the inside of the flower, for its wall are sticky from the excretions of the stigma of the pistil. In some cases the anthers are not removed and then the interior of the flowers have a mussy appearance.

The plants are sold as was mentioned above by the bud, 15c wholesale and 25c retail, the price never seems to go above this mark. When you are buying a plant you are required to pay for every bud that is visible, no matter whether it is open or not and it does not make any difference how small the bud may be.

So the next time you see an Easter lily just stop to remember that this plant has been growing for a good long time, and all for the purpose of making some one happy on one particular day of the year.

Horticulture in Extension Work

(Concluded from page 393.)

ing of it. Otherwise, it comes in competition with a fair grade of fruit and the market does not recognize much difference in it during the fall and early winter months. Thus we are helping to solve the problem of getting more of the consumer's dollar for the producer.

Then let us strive to save "the orchard lands of long ago" as well as to develop the great commercial orchards. For surely a productive, well-kept farm

orchard stamps that place with thrift, happiness and plenty, and all that goes to exemplify a true home, which is the most sacred and cherished organization in society.

What reference to the charms of the suburban or rural life would be complete without an eulogy to the family orchard, or what inducement is held out more prominent to people contemplating a life in the country, than the picture of an orchard laden with fruit or a cellar lined with barrels of apples?

Horticultural Tour of Neighboring Campuses

(Conducted with the idea of impressing on Ohio people Ohio State's need.)

MICHIGAN.

Our Horticultural Department is unique in several ways, perhaps it is most noteworthy from the fact that it has enrolled 65 per cent of the agricultural students of the College. Its popularity among the students and its fame abroad can be traced to two factors, namely, the personnel of its teaching force and the scope of its course.

Every man connected with the department is full of horticultural enthusiasm, and all have the faculty of infusing this spirit into their students. Its leaders are men whose influence is a potent force in the lives of every son of M. A. C. Thomas Gunson has been an inspiration to every student for over twenty years, and in later days Prof. H. J. Eustache has flooded the department with enthusiasm and energy and brought the course where it is to-day.

The regular student in agriculture is required to take two courses in the Horticultural Department, i. e., "Fruit Growing for Home Use," and "Plant Propagation." The required work for those specializing in horticulture begins in the Junior year and consists of courses in Pomology, Greenhouse Industry, and Landscape Gardening. In the Senior year the following courses are required: Plant Breeding, Evolution of Cultivated Plants, Experimental Horticulture, either Advanced Pomology (three terms), or Advanced Landscape Gardening (three terms), and three terms of Seminar, in which practical horticultural problems, such as co-operation, horticultural literature, and experiment station work are studied. Besides the above courses for regular agricultural students, courses for the girls of the Home Economics De-

partment are offered as electives. They are: Plant Propagation, Vegetable Gardening, Landscape Gardening, and Floriculture.

This program of studies is very broad and provides both practical and theoretical training. It provides men not only for technical positions, but annually sends many back to the farm, and these are they who are bringing the horticultural industry of Michigan into its own.

D. F. FISHER, '12,
Michigan Agricultural College.

WISCONSIN.

The work in the Horticultural Department of the College of Agriculture is directed by Associate Professor J. G. Moore, who has in his charge an instructional force of five men. The courses offered are designed to give the student a thorough working knowledge of Horticulture work. Studies taken up are Principles of Fruit Growing, Fruit Growing, Vegetable Gardening, Vegetable Forcing, Fruit Culture, Landscape Gardening, Plant Propagation, Floriculture, Plant Breeding, Experimental Horticulture, Pomology and thesis work.

The first course in Fruit Growing is a lecture course covering the principles of fruit growing and is required of all students taking the agricultural course. Practical work in spraying, pruning, cultivation, and various other practices, including construction of fruit packages, and plans for storage houses, is given in the fruit growing course. Vegetable Gardening and Vegetable Forcing cover the principles involved in growing vegetables, and include practical work in the gardens and green-

houses. Landscape Gardening takes up the art of planning, mapping, and planting the grounds, also study and identification of ornamental plants. In the Plant Propagation work the various methods of propagating horticultural plants is carried out in the greenhouses and in the fields. The Floriculture course is especially designed for women and practical work in this line is given. The Small Fruit Culture consists of a discussion of the principles involved in growing small fruits. Plant Breeding takes up in lectures the theories and practices of the art, and in the laboratory the practice in selection, and crossing of plants. Students wishing to take up further work in horticulture can take experimental work, which consists of planning experiments, keeping records, and doing actual experimentation in the laboratory, greenhouses, or orchards. The course in Pomology takes up the classification, identification, judging, and methods of handling our common fruits. Every important variety of apple in this state is studied, as well as many other varieties grown elsewhere. Work with grapes and plums is also taken up in the laboratory, while the other fruits are taken up in lectures. In thesis work the student is either assigned to library work, or to some experiment. The library work consists of writing up some important topic of Horticulture, whereas the experimental work deals with plant breeding, propagation of plants, or some other work pertaining to Horticulture.

The Department of Horticulture is exceptionally well prepared to carry on all these studies. With its new two-story brick structure costing about \$60,000, and new potting house, greenhouses, and pathologium, and complete set of apparatus, it can give the student

the best possible training. Our building is used by the Horticultural Department and Plant Pathology Department. The building has been occupied only since the beginning of the year. The basement and first floor are used by the Horticultural Department. The second floor is devoted to a large lecture room and Plant Pathology work, and the attic is used for storage and for extension of laboratories of the two Departments.

From the horticultural standpoint the basement floor contains a large machine laboratory; a fruit and vegetable store-room; a seed storage; one miscellaneous storage; a student tool room; a work room; and a spraying laboratory fitted with chemical benches, and is sufficiently large to accommodate about 40 students at one time.

On the first floor are to be found the offices of the various members of the staff, including one general office, three instructors' offices, two offices and private laboratories combined for research men; a laboratory for research students; chemical store room; cloak room; reading and seminar room; a lecture room capable of holding about 80 students and a table laboratory for work in landscape gardening, seed inspection, and various other work which is not of a microscopic nature.

In the experimental orchards and gardens, in connection with the farm, the students get all the practical work necessary for carrying on the art of fruit growing.

OTTO A. REINKING, '12,
University of Wisconsin.

PENNSYLVANIA.

The development of the agricultural school of this College is of comparatively recent date. The School of Agriculture up to the years of 1907-8 was in a single unit, but at that time a four-year

course in Horticulture was established under the direction of Prof. Wm. A. Buckhout. Prof. Buckhout found sufficient time to assume charge of the Botany Department as well. About 1900 the botany work became of sufficient importance to require all his time and Prof. Butts took his place. Prof. Butts died in March, 1908, and Prof. R. L. Watts, the present head of the Department, took charge. Prof. Watts is a graduate of the class of 1890, and from the time of his graduation up to the time he took charge here, was engaged in practical work, in which he was very successful. Under his able direction the horticultural course has become the largest and probably the strongest course in the Agricultural School.

As in the other departments, the growth of this department has been faster than the increase of appropriations from the state, and it has been somewhat handicapped by lack of proper equipment, but at present it consists of a new **\$100,000 Horticultural Building** in the course of construction, containing twelve class rooms, several laboratories, and eight offices. It is being built of pressed brick with brown sandstone trimmings. There are two sets of greenhouses. One connects with the Botany Building and contains the palm garden and ornamental plant room. The new set of two greenhouses, each 30x100 feet, are used, one for flowers and the other for vegetable forcing. Both houses are connected by a head-house, 25x72 feet, which is used for practicum and class room work.

All agricultural courses are the same during the first two years of the course, consisting of work which gives the student the essential training and developing of the mind that is expected of the college graduate. The last two years

are spent in specializing in whatever the student desires to follow. The horticulture option being one of seven different options.

Throughout the horticultural course the practical side of the work is given particular emphasis

The students usually work on farms, in market gardens, or in greenhouses during the summer vacations.

In short, it is the aim of the horticultural department to give the student as much of the theoretical side as possible, together with practical experience with men outside who are up to date as to methods and of culture, marketing and management, thus making the student as broad as possible in his training.

We horticulturalists are proud of our department, because we claim to have the right location, good equipment, and best of all, instructors of wide experience and recognized ability. We are very much interested in our course, very enthusiastic in our work, and have confidence in the ability of our instructors, three very important and fundamental factors in getting the best there is out of our college course.

H. G. FASSETT, '13,
Pennsylvania State College.

MASSACHUSETTS.

One of the most lively Divisions in the Massachusetts Agricultural College is the Division of Horticulture. This includes the distinct departments of horticulture, landscape gardening, pomology, floriculture, and forestry, with market gardening and drawing each ranking as "sections."

The remarkable increase of fruit-growing in Massachusetts recently has brought pomology into great importance. Besides the courses for the four-year students, and short-course classes,

more special courses are conducted. A two-weeks packing course under an expert from the Hood River Valley has just closed. It was very successful. The Extension Division maintains at present ten demonstration orchards, having from 400 to 600 trees each. It is estimated that already these orchards have caused the setting of 10,000 new trees by farmers in different parts of the state.

Landscape gardening, landscape art, and allied subjects draw many students to the department of landscape gardening, which has a high reputation throughout the country. Men graduated from these courses take important positions on estates and in city improvement departments.

Forestry, a recently organized department, is growing rapidly. At present the enrollment numbers fifty. Floriculture and market-gardening have all

the students that can be cared for.

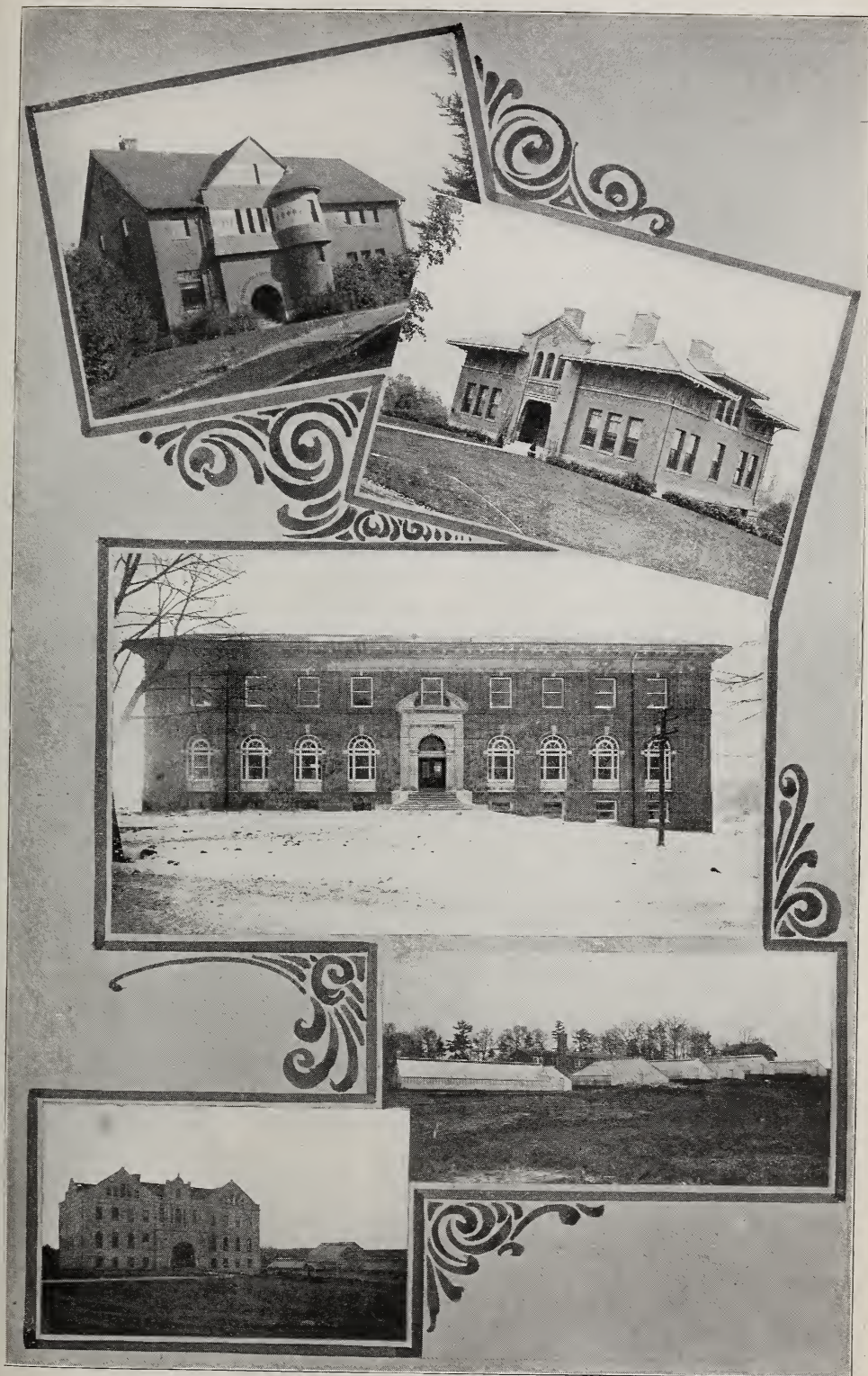
The development of the division from an enrollment of 38 students, to one of 454 in all departments, has taken place in nine years under Prof. Frank A. Waugh, who has not only technical knowledge and administrative skill, but also a lively tongue and a facile pen. His talks and his writings are familiar in many places, and are always interesting.

The men now associated with Professor Waugh in the work are: Prof. Edward A. White, floriculture; Prof. Fred C. Sears, pomology; Associate Professor Frederick F. Moon, forestry; Assistants: Prof. Frederick L. Yeaw, market gardening, and Messrs. Frank W. Rane, state forester; Alvah J. Norman, extension; Arthur K. Harrison, landscape.

B. W. ELLIS, '13,
Massachusetts Agricultural College.



FILLED TO OVERFLOWING AT OHIO STATE.



ON OTHER CAMPUSES.

The Passing of a Notable Greenhouse

C. B. DURHAM, '12

ALTHOUGH greenhouse work has never been considered a feature course of the University, some notable experiments have been carried on under the glass adjoining the Horticultural Building. Just at this time when the historic houses are giving place to new ones some mention of their importance to the horticultural interests of the state is rightfully due them.

Among the early and more important achievements in the old greenhouses are those dealing with sub-irrigation, which had its origin here in 1890, when the State Experiment Station was connected with the college. While sub-irrigation, for various reasons, is not largely used to-day, the work done here is significant in the science and art of forcing crops under glass. The sub-watering work was successful from the start, especially so far as growing the crops was concerned, but came near being a failure from the experimental standpoint on account of the warping of the board bottoms of the benches. As concrete construction was not in wide use at that time, it was thought that sub-irrigation work would have to be confined to ground benches. The system was abandoned after a few years, but not until after it was shown that overhead water was not necessary, and that the crops in many cases had been increased by fifty per cent, and in no case was there a decrease as compared with the old methods.

The work done in these houses had much to do with bringing Grand Rapids lettuce before the public. This fact is of great importance when it is remembered that the lettuce forcing industry in the Middle and Western States practically owes its existence to this variety

of lettuce, in fact there has never been any other variety which proved a commercial success in the region above named.

In a modest little greenhouse constructed of hotbed sash just south of the old farm house the first recorded attempt was made to grow onion sets for transplanting. The work was then transferred to the houses recently torn down, and there completed. The first crop, which was a record one, was 1500 bushels per acre yield. This one demonstration has been of material value to the producers of the state.

Tomato forcing as a spring crop, after three crops of lettuce have been grown, was first shown to be practicable and profitable for this section. Before this time winter forcing of tomatoes had been a paying practice in the East, but not in Ohio. Tomato forcing as a spring crop in these houses paid from the beginning, but it was a question of several years to establish a rule for the proper time for starting plants, and the distance apart and other facts.

The south end of the lower house was used by the Station Entomologist, Mr. C. M. Weed, for an insectary. This attracted much attention at the time because of its novelty.

These houses were built just at the transition period between hotbeds and hothouses, and were among the first vegetable houses of the state. There were many houses at the time for forcing flowers, but only a very few for vegetables. This industry owes its establishment in the state to these houses.

Of the more recent work in these houses are a series of experiments deal-

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Cost of Living in Germany

PROF. W. R. LAZENBY

I HAVE been but a short time in Germany, but I have been greatly impressed with the comparatively low cost of living in that country. I think that the actual necessities of life are much cheaper here than in any country that I have so far visited. One can enjoy a fairly comfortable living upon what appears a very small income.

There are, of course, many and various reasons for this, and with some of these I do not claim to be acquainted. Some things, however, are at once obvious and unmistakable. In the first place, the Germans are eminently industrious. The idle proportion is extremely small and a very large proportion of the people are engaged in some productive industry. If we would omit or except the more or less burdensome military system, this would indeed be a nation of workers. To an American much of the labor, especially that applied to the production of the farm and garden products, seems inefficient and of this I shall have something to say in the future; yet steady, plodding work counts in the end and the Germans are everlastingly at it.

Germany is prosperous, not entirely perhaps, but mainly because her people are constantly producing. Although human nature is much the same the world over and examples of recklessness and prodigality are found everywhere, here they appear to be marked exceptions. Another characteristic is a well developed sense of order. Things are done methodically. "A place for everything and everything in its place" is carefully observed.

One sees little disorder or confusion anywhere. Some of the work may be done clumsily or inefficiently, but it is

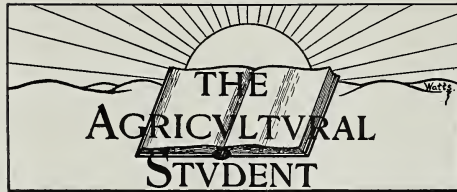
done systematically and with a good degree of thoroughness. Another quality that tends to make living cheap is economy, and this is universally practiced here. Nothing goes to waste. No one is ashamed to be economical nor to have it known that he is so. Every one seems to know just what his income is and is very careful not to spend more. Whether the income be large or small, there is no waste. No paper, tin cans, bottles, old rags, bits of twine, etc., are to be seen on any street or in the alleys or vacant lots. Nothing is thrown away. Even in the homes of the well-to-do a rigid, systematic economy is practiced.

You will never find a lighted lamp or an electric light carelessly left to burn to no purpose. If you leave such a light in your room, someone quietly comes and either turns it down or puts it out. This is done not from motives of parsimony, but from habit, a sincere inbred desire to prevent waste.

Another thing that helps to make living cheap in Germany is the comparative absence of middlemen or go-betweens. The producer and the consumer are brought close together, largely through the agency of the parcels post system. In other words, the method of exchange and distribution of the more essential products are comparatively simple and inexpensive. Some of the reasons for this are hard to find. The distance between the market centers are not great, the village or rural population is dense, the roads or public highways are excellent, the steam and electric roads numerous and accommodating.

To a large extent the consumer deals directly with the producer, receives a

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COLUMBUS, OHIO, MARCH, 1912.

Editorial

The crying need of our College of Agriculture at the present time is adequate housing for our Departments of Horticulture and Forestry. That the need should have been ignored this long is a marvel to all who behold the actual conditions. There are to-day 237 students taking work in horticulture. These, with about 100 enrolled in forestry courses, makes a total of almost three and a half hundred, crowding into our old, beloved (but sadly antiquated) horticultural building. There are 77 horticultural students in the Winter Course, and this made at that time, considerably over four hundred students clamoring for instruction from these two departments.

Thus we see that the present building is totally and woefully inadequate

to meet the demands made on it. No one denies that.

Ohio is ideally situated to foster a mighty horticultural industry. Here horticultural interests have grown to be among the largest in the state. The future looks roseate and promising from every viewpoint. Young men (and women) are turning with longing eyes towards the study of horticulture. The apple, the peach, the grape, the vegetable, the blossom, all these they want to know how to rear and to market. They should be given the very best means possible of finding out these things. To know, in a more general way, will make a happier people, a more efficient state. What is Ohio going to do to supply that demand for instruction?

Ohio has always prided herself on her forests and her forest products. Her forest primeval, for grandeur, beauty,

and from an utilitarian viewpoint was second to none. It sheltered her sons of copper hue, it furnished homes and farmsteads for the adopted Aryan. Ohio's Forestry School should be the best in this country, and yet—, The building and equipment is the first prerequisite. Give us that now, and the other we shall find.

Prof. Selby most forcibly points out the demands for plant pathologists, yet we have not the wherewithal to educate experts properly.

Our crying need is a fine new building for these departments. Why don't we get it? We can. How? Ask for it? True we have asked and asked and asked. But this time we are going to make our appeal irresistible. Everybody get under now, and boost! Fine.

In choosing the Editor-in-Chief and Business Manager of THE AGRICULTURAL STUDENT

CONGRATULATIONS! DENT the Agricultural Society has builded well. We congratulate our clientele that they are to be served so ably and so well.

Mr. Kile, above all others on our staff, knows the policies and hopes and aims of this paper and next year is sure to see a big step forward in their fulfillment. Never will this editorial quill have been wielded more ably than when he comes to grasp it.

Mr. Williams will maintain the high business standard to which the magazine has been raised. We know of no other quite so well fitted to take over that mighty work.

The new staff will be announced as soon as possible. All prospective candidates should interview the editor-elect. "The best man in the best place" continues to be our motto. No worthy man hides his light under a

bushel. If you have talents, or ambitions, come and see us.

Then 'tis congratulations all around—to present management, to new management, to advertisers, and best of all, to our large and stable clientele of readers and supporters. Congratulations!

This special Horticultural number of THE AGRICULTURAL STUDENT

OUR APPRECIATION. would never have been possible without the kindly assistance, so graciously tendered us, from so many sources.

For the subject matter, we are profoundly grateful to the various parties who have so kindly favored us by giving us of their time and brain.

The illustrations come from various sources. To the Livingston Seed Company, Columbus, Ohio, we are especially indebted for many of the fine ones which illumine these pages.

For the use of other cuts we extend our thanks to the Ohio State Board of Agriculture, the R. M. Kellogg Company of Three Rivers, Michigan, and to our own University Extension Department.

To our contemporaries at other colleges we are very grateful for the subject matter and photographs, which convey to us so forcibly our own need of increased horticultural facilities.

The burden of collecting most of the subject matter of this issue fell on the shoulders of our esteemed associate, R. W. Jordan.

Prof. Paddock has given us most valuable assistance in many ways.

Thus our hearts are glad because of the goodly spirit of cooperation which we find on every hand, and it is our appreciation we wish to express. We trust

our readers find as much pleasure in perusing these pages as we do in presenting them.

Spring, glorious, soul-filling spring, the most delectable season of all the year, is upon us. With the **SPRING!** return of the red breast and resurrection of the grass, we should also experience a return of seasonal joys and a resurrection of new hopes, new ambitions, new determinations.

As the vernal season approaches we are thrilled through and through with the happiness born of hope. As the advent of spring presages the time of planting and toiling and reaping, so the emotions it awakens within us look forward to a rich harvest of gladdened spirit.

Get your soul in harmony with the spring time spirit. It makes the bird sing more sweet, the violet smell more delightful, the greensward appear more beautiful. Cultivate an appreciation of Nature's wonderful spring-time sympathy.

We want that new Horticultural Building just as soon as possible. The need is dire, indeed. **"NEW BUILDING."** When we get it, Ohio will take one of the mightiest steps forward in all her horticultural career. We want a building entirely worthy of the industry. **We want the finest building devoted to Horticultural Instruction in all America.** We can all help mightily. The thing to do is to boost the movement. Help along the "New Building and Finest Building" slogan. Be "doers of the word." Every student, every alumnus, every one of the host of the friends of Ohio State, should use their utmost influence to this end. Do

your part. Do something definite. Do it now. Boost! Do!

Husbandry holdeth happiness. The tillage of land, the rearing of animals, the training of vines **CULTIVATION AND CULTURE.** present the noblest work wherein the sons of Eve may engage. The farmer should be the happiest of all men, because of his close co-partnership with Nature. Yet all too often he does not realize his grand opportunity for getting the most out of life. What we all need is a good practical course in appreciation. We need to understand the marvelous forces of Nature, we need to read the language of the flowers and leaves and birds, we need to see beauty in dirt, we need to delight in the majestic aroma of the freshly plowed field, we need appreciation.

Appreciation comes through education. We get most pleasure in reading facts in the light of past history, in the light of science, in the light of philosophy and ethics and psychology, yet how woefully lacking is our knowledge of these things! We know too little of the literature of nations, by which we might better express and interpret the unwritten literature which surrounds us everywhere.

The tendency is often to make our learning ultra-practical. We look too often from the dollar viewpoint. Money talks, 'tis true, but it does not talk to the soul. We need the practical knowledge, but if sauced with the aesthetic we shall devour it all the more greedily.

We need more of the cultural subjects. If foreign language is dismissed, put English in its stead. It will make us broader men, capable of some degree of expression.

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NEWS NOTES



ELECTION!

At the annual election of the officers of the Agricultural Society the reins were put in the following hands:

S. M. Salisbury, President.

R. R. Buchanan, Vice-President.

R. Q. Smith, Secretary-Treasurer.

V. L. Overholt and G. B. Crane, Program Committee.

R. F. Crim and B. E. Pontius, Executive Committee.

O. M. Kile was unanimously elected Editor-in-Chief of THE AGRICULTURAL STUDENT, and likewise was B. A. Williams selected for Business Manager.

Besides these two the Board of Directors will consist of H. D. Drain, W. L. Love, and R. Jaeger.

After having been confined to his home for three weeks through sickness, Prof. H. W. Vaughan was granted a leave of absence from the University. He has left for the Adirondacks, where he will spend some time regaining his health.

EXTENSION SCHOOLS CLOSE.

March 15 saw the close of the last of the Extension Schools for the year 1911-12. In all 46 schools were held throughout the state, with an attendance of 7,000 people. This has been one of the most successful years in point of attendance and interest since these schools began.

Professor William R. Lazenby, head of the Forestry Department at Ohio State, is at present in Germany and on his way around the earth in the interest of forestry and horticulture.

PROF. E. F. RINEHART, '10.

Professor E. F. Rinehart, '10, of the Dairy Department, has accepted a Government position to investigate farm and commercial dairies in Idaho, Oregon and Washington, with headquarters at Boise, Idaho. Professor Rinehart graduated from Ohio State in 1910. Since that time he has been in the Extension Department, and for the past few months he has been in the Dairy Department of the Agricultural College.

The Ohio State Poultry Institute is to be held at Columbus, Wednesday, April 6th, in the Board of Trade Auditorium. The management of this Institute is under the joint auspices of the Ohio State University, Ohio State Board of Agriculture and the Ohio State Poultry Association. The University will be represented by Mr. Jacoby and Prof. Plumb. Mr. Jacoby will give some demonstration work. Prof. A. G. Phillips, of the Indiana Experiment Station at Purdue, will lecture at the night sessions. Mr. Sherwood, of the Ohio Station, will also take part in the program. An egg exhibition, under the auspices of the students of the University, is contemplated.

Four new Prairie State Incubators have been purchased by the Poultry Department. This makes a total of ten machines.

Five Aberdeen Angus calves have been added to the University herd. They were purchased from Dr. Brown, of Hillsboro, O. It is hoped they will develop into ribbon gatherers.

TO TEACH IN SUMMER SCHOOLS.

A number of the instructors in the Extension Department will teach agriculture in the summer schools of various Ohio Colleges. Prof. A. B. Graham will go to Antioch College, Otterbein University, and Wooster University; Prof. M. A. Bachtell will go to Heidelberg University, while Profs. A. M. Johnson, H. E. Evans, J. H. Gourly, C. J. Grant, and W. H. Darst will teach at Ohio State's summer school.

Professor A. B. Graham, of the Extension Department, attended the meeting of the Department of Superintendents of the National Educational Association at St. Louis, Feb. 27, 28 and 29. Prof. Graham is recognized as one of the leaders in Rural Education and Extension Work. He addressed a number of the sectional meetings.

SHEEP SHEARING AT THE OHIO STATE UNIVERSITY.

The public sheep shearing contests at the Ohio State University promise to be of unusual interest. There will be demonstrations of shearing by power machines, with hand machines, and common hand shears. One of the most noted professional shearers in the world will be there, and will give public demonstrations of the work with the machine. This is Mr. Angle, of the Chicago Flexible Shaft Company. He gives demonstrations all over the world and has spent much time in Mexico and in the Argentine Republic, and in the course of the next month or so, will go to South America. In connection with these contests, professional shearers are regarded as men who make a business of going about over the country and shear sheep for various people for compensation. An amateur shearer is a man who does nothing outside of his

own flock. The University desires also to offer a prize for boys under 14 years of age, and would be glad to hear from any boys under that age who would like to take part in the contest.

The exhibition will be in the beautiful big Judging Pavilion of the University, where if necessary 500 people can be splendidly accommodated, and where a large number of sheep can be shorn at one time.

There is no other event of this sort today in the United States taking place, and it is to be hoped that Pennsylvania, West Virginia, Ohio and Michigan will be well represented on this occasion.

Premium lists will be ready for mailing about the 20th of March, and the University will be pleased to mail copies of these to anybody desiring them. There will be generous money prizes offered for the contestants in shearing, and also some other attractions offered.

Remember, these contests take place on Friday, April 5th.

The Animal Husbandry Department recently purchased two Duroc Jersey and two Berkshire sows. The Durocs come from the herd of Thomas Johnson & Son, of Columbus, and the Berkshires were bought at the Ohio Berkshire Association sale.

TRAINED HORTICULTURISTS IN DEMAND.

Numerous requests from all parts of the country are received by the Horticultural Department for trained gardeners, orchardists, landscape artists, etc. Many of these are responsible positions at a good salary. But few of them can be filled on account of the lack of men. The Department certainly needs a larger building and better equipment to meet the ever increasing demand made on it.

SPECIAL TRAIN.

From March 26-30 a special train will be run over the Baltimore and Ohio Railroad from Bellaire to Marietta, then from Belpre to Chillicothe, passing through Belmont, Guernsey, Muskingum, Morgan, Washington, Athens, Vinton and Ross counties. Lectures will be given on Horticulture and Corn Culture. Night meetings at Zanesville, McConnelsville, Athens, and Chillicothe.

The Extension Department will give pruning and spraying demonstrations this spring wherever desired. These demonstrations are given by trained men and are very popular, as they give the fruit grower practical instruction in the most scientific and up-to-date methods of caring for his trees.

March 7th, Prof. Erf went to East Claredon, Ohio, to make a test of the cow, Vanostine Belle De Kol, a new prodigy in milk and fat production. Her test will be completed March 25th.

Prof. Erf left for Washington, D. C., last week, to appear before the congressional committee investigating the Lever bill, which removes the 10 cent tax from oleomargarine.

Arrangements are being made to give student practice in running incubators in the near future in the incubator cellar at the Judging Pavilion.

Two modern colony brooding houses have been completed and it will only be a question of a few weeks until they are fully inhabited.

Richard Faxon, '10, has a position as Deputy Horticultural Commissioner in the State of California.

BIOLOGICAL BUILDING.

The contracts for the new \$100,000 Biology Building will be let the last of the month. This building will be located opposite Oxley Hall, where the old Veterinary Hospital now stands. Fifty thousand dollars of the full amount is now available.

Professor J. H. McNeil, of the Veterinary College, has accepted a position as manager and inspector of cattle and meat on a nine million acre cattle ranch in southern Brazil.

We are glad to see that Acting Dean Vivian, who has been sick for some time, is again able to be at his office.

"The demonstration was a God-send to our neighborhood." Thus speaks one man of a spraying demonstration, that was made in his community, by the Extension Department.

CULTIVATION AND CULTURE.

(Concluded from page 410.)

The great question of rural sociology we do not get an inkling of. What know we of the country problems, the church, the school, rural citizenship, the real vital issues? One of the most important parts of our education has been woefully slighted.

Cultivation and culture are both the handmaidens of agriculture. Give us them in more equal degree. 'Tis easy They are naturally and inherently correlated. Make us see this application. Then you make land lovers and not land miners out of us. Only when this gospel of cultivation and culture is enthroned firmly in the hearts of all her ruralists, will our state have a happy, self-respecting, farm-loving rural population. Give us then, cultivation (of land) and culture (of mind).

The Cost of Living in Germany

(Concluded from page 407.)

fair price for his products and the consumer is not obliged to pay an unfair price for them. So far as I have seen, commission houses and commission men are not plentiful here and are certainly less necessary than where distances from market are greater, population less dense, and facilities for transportation less perfect.

Although things are mainly sold at retail and in surprisingly small quantities, there is such a division of labor that the work is done with comparatively little expense. For example, nearly all garden, and a large part of the farm products, are marketed by the women of the family that produces them. One sees very few men buying and selling products of any kind, either in the public market or groceries, shops and stores. It is not a case of "everybody works but father," for as a rule

the men are quite as industrious as the women. The men are working on the farms or in the gardens or in the shops or at some trade or other.

Another thing that lessens the cost of living is the fact that rents are low.

The rooms from which I am writing these few words overlook a beautiful garden, the home grounds of a director of a bank that is apparently prosperous and has many patrons. This bank is on the first floor of a large and well-appointed dwelling house in which the director and his family live in elegant style. It is by these and other means that the cost of living is kept down. This all goes to show that the Germans are a practical people. They may have a too great belief in the necessity and potency of the imperial army and navy, but outside of that they are neither wasteful nor extravagant.

The Passing of a Notable Greenhouse

(Concludede from page 406.)

ing with the effect of various soils and fertilizers upon forced vegetables.

The starting of sweet corn in the greenhouse was tried here last year, and by subsequent transplanting the crop was put upon the markets two weeks earlier than that grown in the usual way. A gain of two weeks in a

spring crop is a consideration of positive increase in a gardener's bank account.

These old houses have paid the state well, for they have surely played an important part in the development of the vegetable forcing industry of the state.



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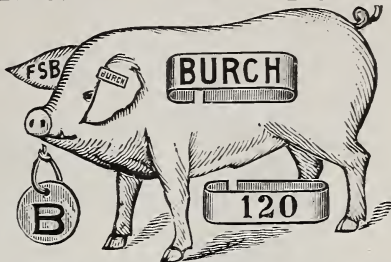
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Do you suspect it in your herd? The best authorities claim that proper disinfecting is the only effective remedy. And you know, if you have ever used it, that the best disinfectant for this and all general purposes is

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It is non-poisonous, easily prepared and guaranteed to kill lice, ticks and stomach worms; it cures mange and scab and prevents hog cholera, etc. Your dealer carries MINOR'S FLUID in stock or can get it from his jobber. If not, write us direct. Get our prices on Dipping Tanks.

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A grain fertilizer should, therefore, contain enough Potash, never less than 6 per cent., better 10 per cent., to balance the other plant foods, produce heavy grain and prevent lodging. Ask your dealer to carry goods of this kind and Potash salts to add to brands low in Potash. **Potash Pays** when you use enough.

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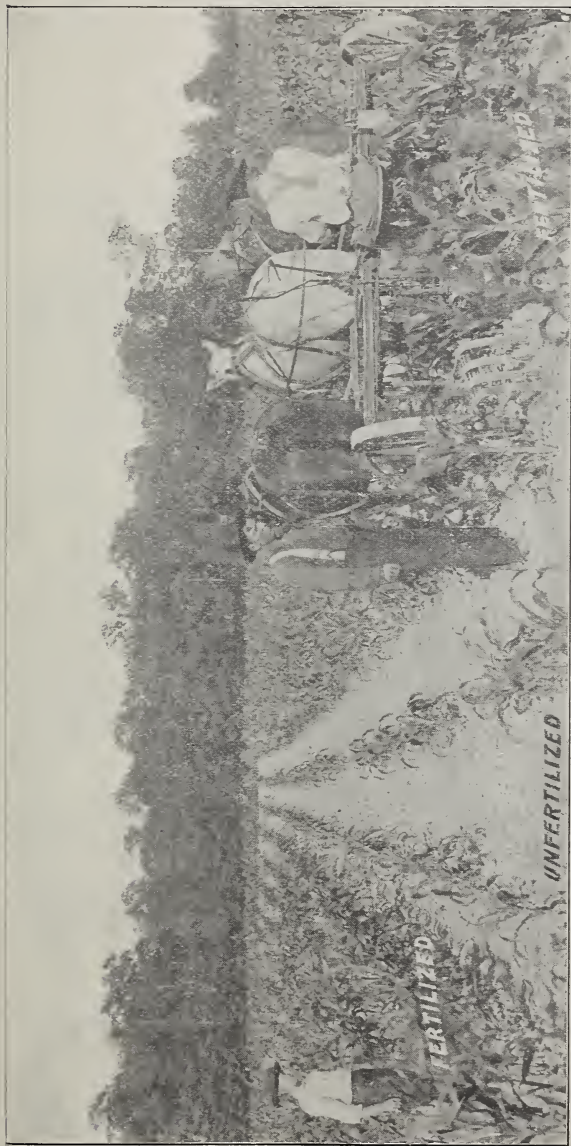
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IMPROVE THE QUALITY

HURRY MATURITY

ENRICH THE SOIL

Use Armour's Fertilizer The Quality Brands

Armour brands feed the plant right from the beginning of growth through to maturity.

Field results are positive evidence of their superiority.

Our factory is located at Union Stock Yards, Chicago, right at the source of supply of **Animal Matter**, such as Tankage, Bone, Blood, which we supplement with High Grade Potash Salts, Acid Phosphate, etc.

All materials used are combined under the supervision of experienced chemists and practical agriculturists, whose experience has taught them what formula is best for the purpose intended.

GUARANTEED ANALYSIS is not our only aim. We go further than that by having the best **AGRICULTURAL VALUE** or field results.

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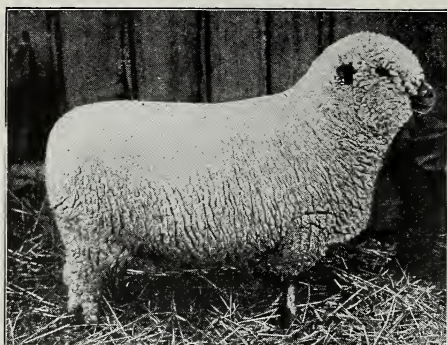
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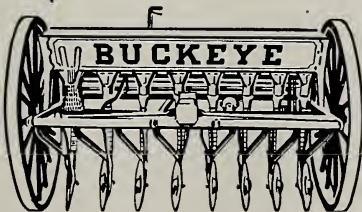
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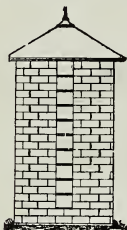


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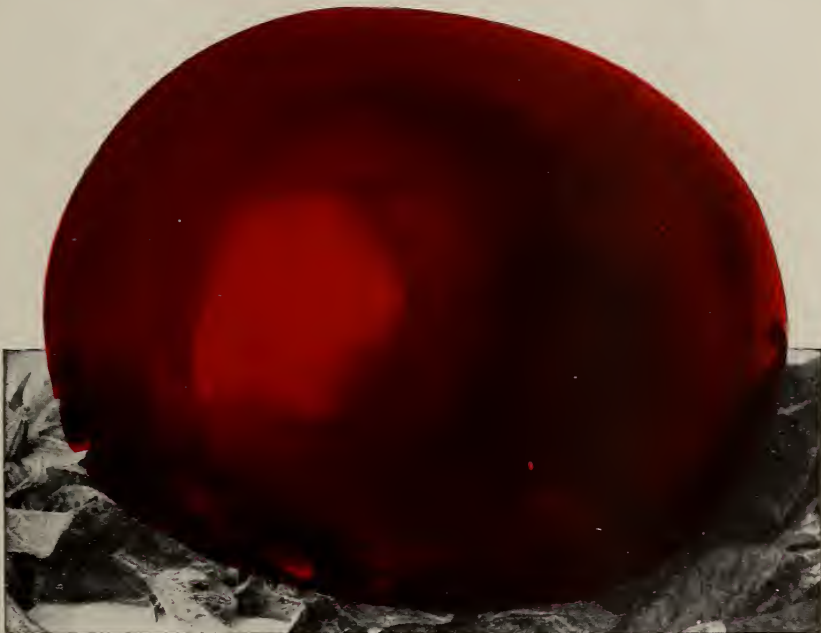
possess the same superb qualities which have made our tomatoes famous. No efforts are spared to make all seeds we sell truly pedigreed. Finest strains of Cucumbers, Corn, Musk Melons, Peppers, and last, not least, **Onions** are grown on our own farms. Our field corn, grass and clover seeds, onion sets, etc., are unsurpassed. Careful men, best methods and modern machinery are employed to coax the best soil to produce the choicest. You can buy **cheaper** seeds and you can pay **more** for seeds, but you cannot procure choicer seeds anywhere at any price.

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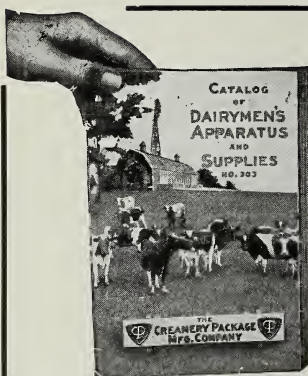
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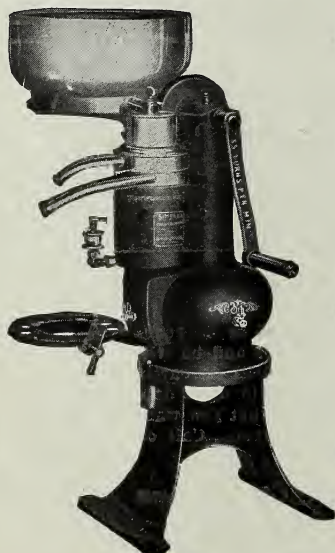
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